Research for Next generation Internet common services

Admire In China

(Advanced Multimedia Interactive Real-time Environment)

National Lab of Software Development Environment (NLSDE)

http://www.nlsde.buaa.edu.cn/admire/

Contents

- What is Admire?
- What we have done so for?
- Technical challenges & solutions
- Future work

the goal of Admire

- **Build a general purpose collaborative working environment for large scale distributed groups**
- **Enable users from different places to communicate and interact with each other via high quality video, audio , and share resources through desktop tools, etc .**

Admire Architecture

Distance Learning | Scientific collaboration | Distance medicine | …… | Tele immersion | Distance site visiting

Different collaborative pattern, control policy, integrated environment

conference management tool set

- Session management tool
- Conference control tool
- Conference archiving tool

Media tool set

A/V tools

- Audio tool
- Video tool

Shared application tools

- WB tool
- chat tool
- Web sharing tool
- App sharing tool

Native Multicast /Hybrid Unicast-multicast gateway

High speed Internet, NSFCnet e.g.

IETF MMUSIC

Multiparty Multimedia Session Control

What we have done so far?

- A/V tools
- Data-sharing tools
- Integrated Environment
- Conference management
- Software package&Hardware spec
- Deployment

A/V tools

- based on Mbone tools of UCL (University College of London)
- introduced new features
- improved performance.

Video tool

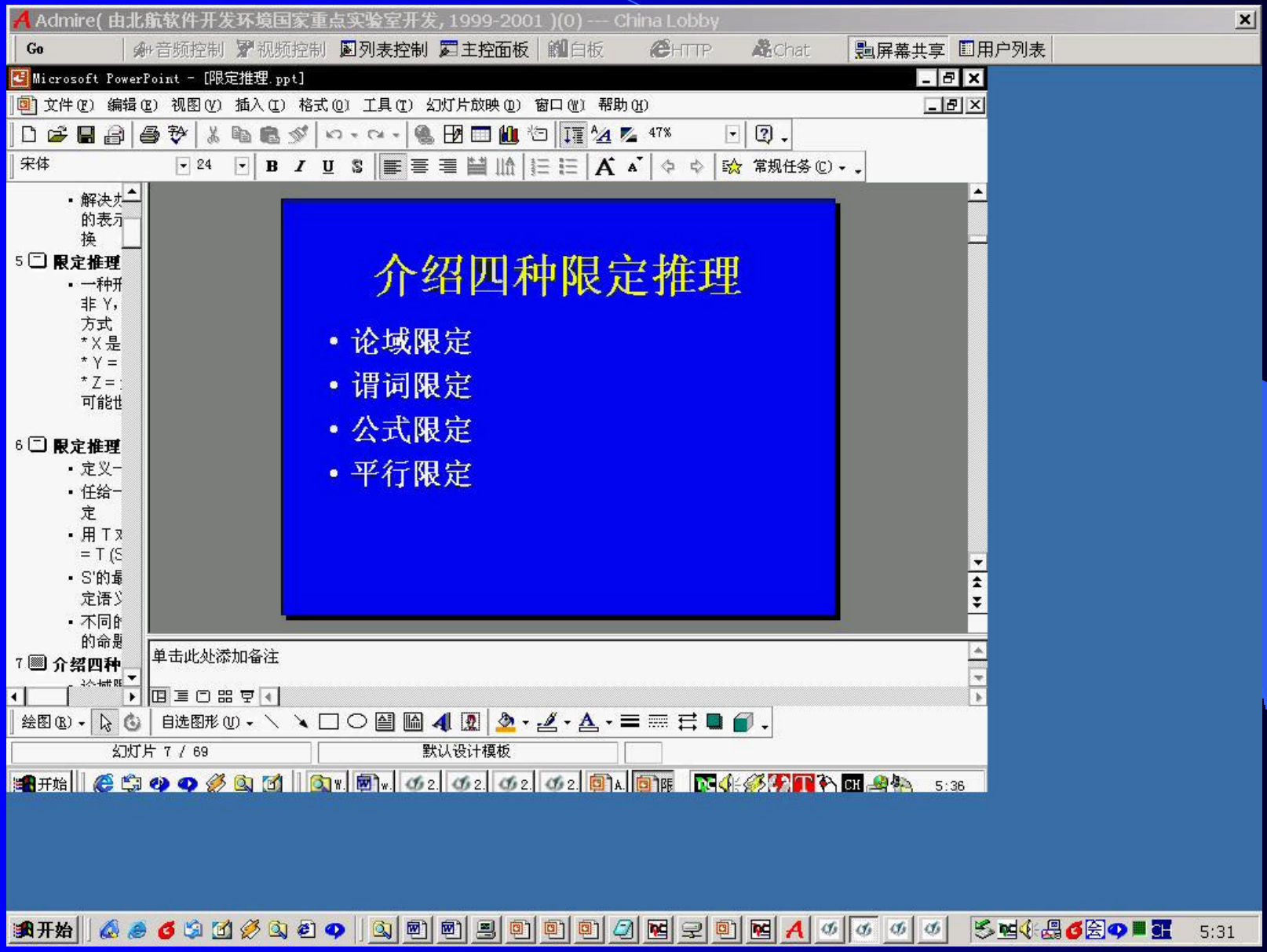
- **Enhanced VIC:**
  - **VIC is a video conference tool, it supports unicast&multicast video communication**
  - **Introduced Direct draw ability to improve the speed of VIC image rendering, which supports 40~50 CIF-size realtime images rendering smoothly**
  - **Introduced Microsoft VCM codec ability ,**
  - **Implemented capturing ability of any-size Window's desktop sharing to all in Admire.**
  - **Designed a light-weight remote control tool to do remote presentation**

VIC

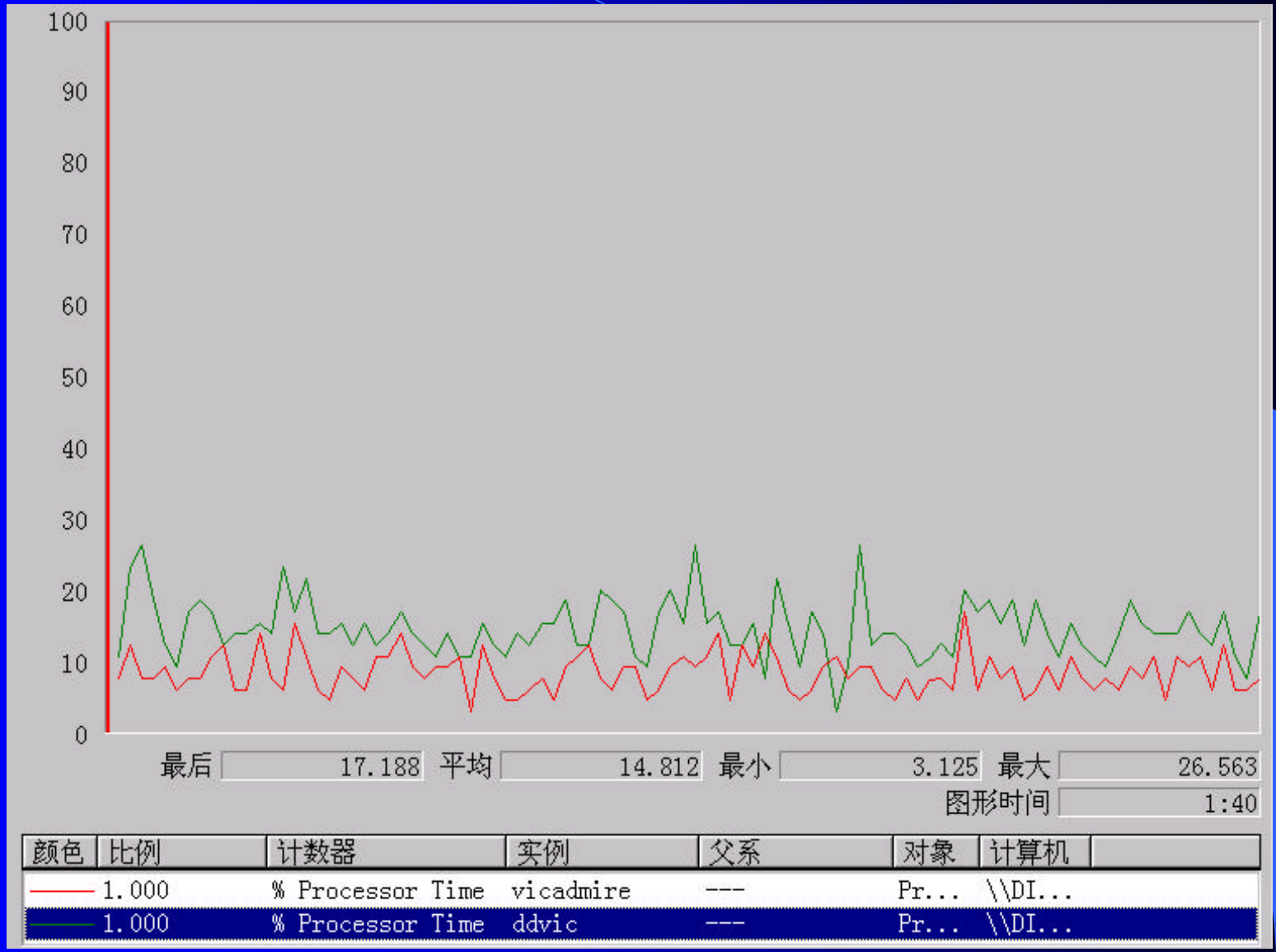
- Unicast & mulitcast
- Bw: 30k~20M bps
- Codec: H.261, h.263, NV, Jpeg, DivX, Mpeg-4,……
- Latency: < 300ms (local processing)
- Video size: QCIF(176*144), CIF(352*288), SCIF(702*576),
- Capture any size for windows desktop screen


北京航空航天大学1
北京航空航天大学2
北京航空航天大学3 (nsfcnet)
NSFCnet
清华大学
Peking University
北京航空航天大学
清华大学
224.8.8.1/8000
NSFCnet
root@210.2
14 f/s 32 kb
静止
北京航空航
friend@210.1
19 f/s 45 kb
静止
北京航空航
friend@210
25 f/s 57 kb
静止
北京航空航天
friend@210.25
21 f/s 340 kb/
静止
清华大学
Harry@210.
21 f/s 69 kb
Peking Unive
chenbin@21
19 f/s 38 kb
静止
VIC v2.8nlsde-2.1.0
菜单
帮助
退出
NSFCnet
解码器...
大小...
模式...
关闭
NSFCnet
解码器...
大小...
模式...
关闭
开始
13:33

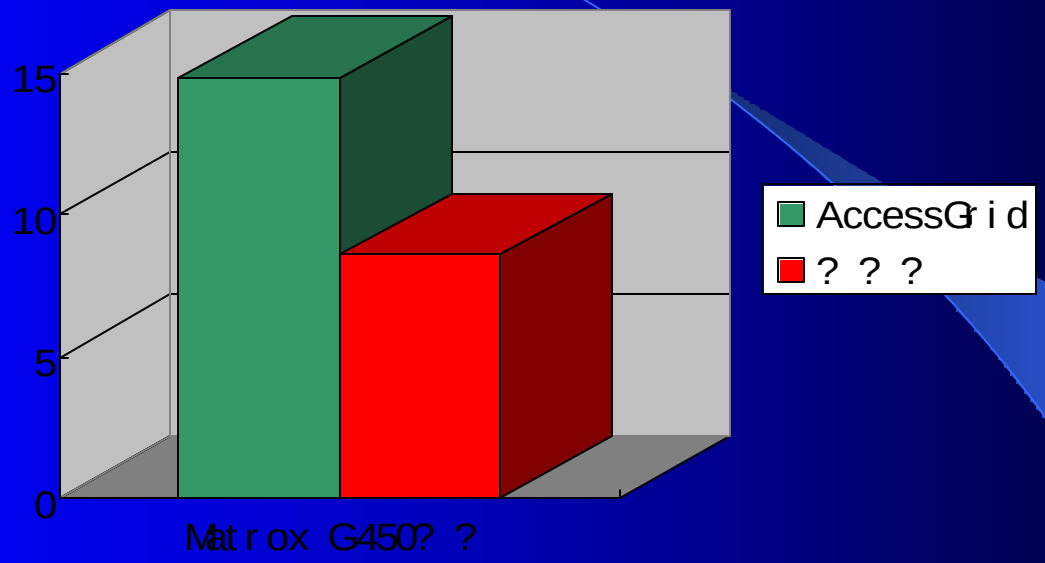
The view of screen sharing



Comparision btw agvic & vicadmire



Comparision btw agvic & vicadmire

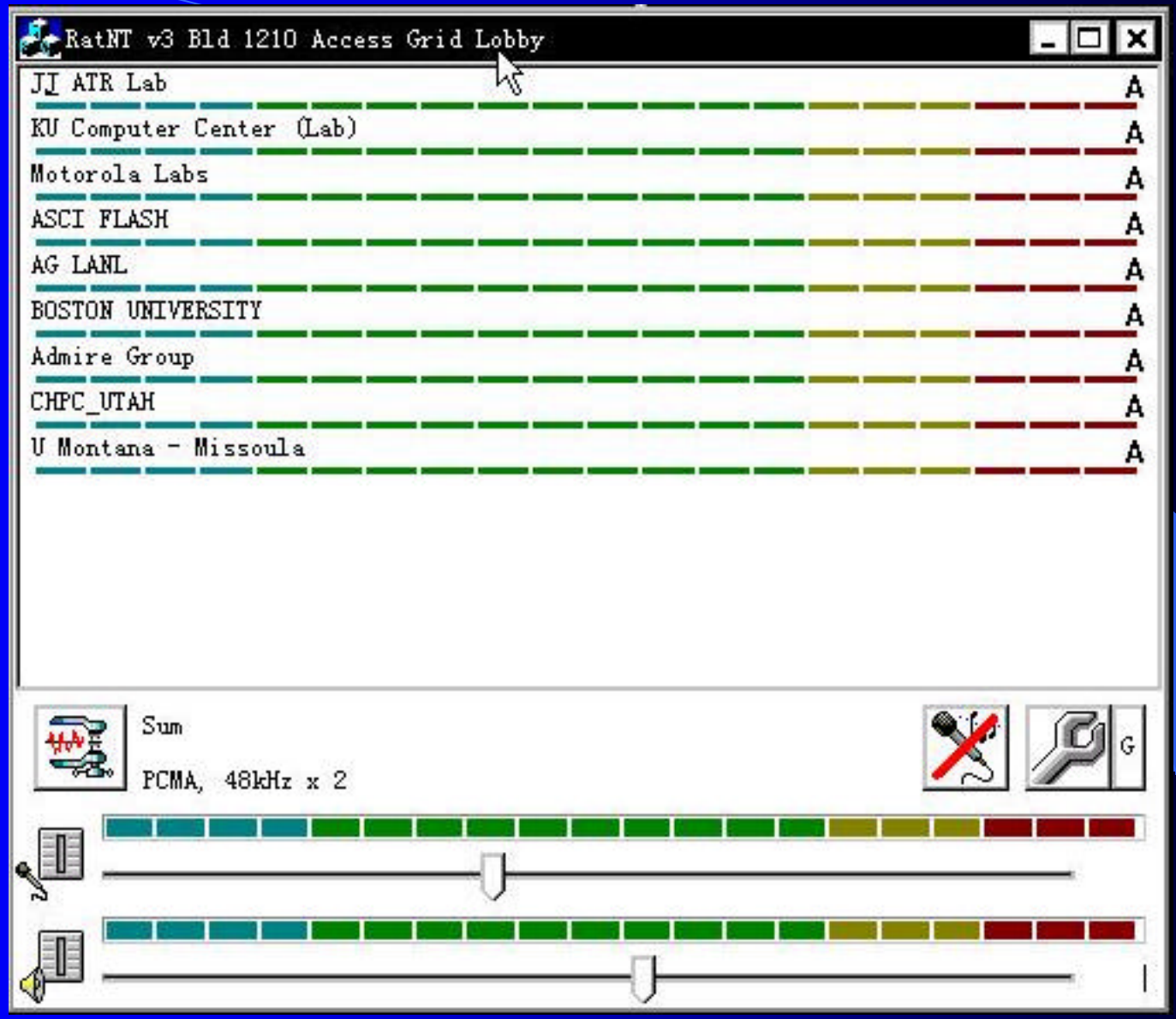


Audio tool

- **Redesigned RAT: (cat)**
  - **Cat is audio conference tool, it supports unicast&multicast audio communication**
  - **designed independently an multi-thread pattern to reduce the latency of audio transmission.**
  - **Introduced Microsoft ACM codec ability , which allows various low-bandwidth audio formats.**
  - **Introduced Direct 3D sound ability, enhanced tele-immersive awareness**

CAT

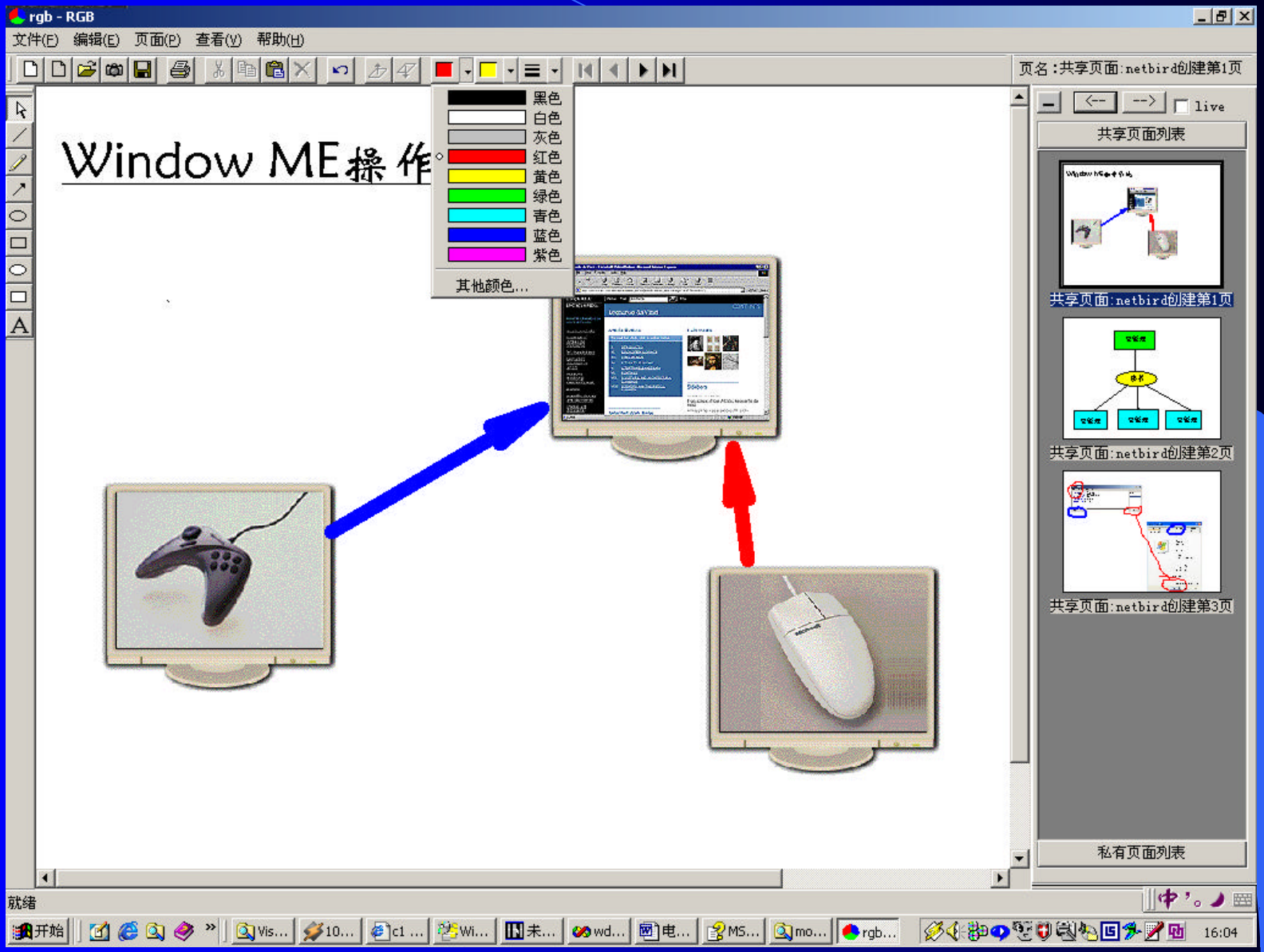
- Unicast & mulitcast
- Bw: 5.3k~1Mbps
- Codec: G.711,G.722,G.728,1 L16, PCM-u, PCM-a, DVI, VDVI, GSM, LPC, G.711, LH, DivX, TrueSpeech, MS-GSM, MP3
- Latency: < 100ms (local processing)


RatNT v3 Bld 1210 Access Grid Lobby
JJ ATR Lab
A
KU Computer Center (Lab)
A
Motorola Labs
A
ASCI FLASH
A
AG LANL
A
BOSTON UNIVERSITY
A
Admire Group
A
CHPC_UTAH
A
U Montana - Missoula
A
Sum
PCMA, 48kHz x 2
G

Data-sharing tools

- **White board**
- **Chat**
- **Web sharing**

White board


rgb - RGB
文件(F) 编辑(E) 页面(P) 查看(V) 帮助(H)
页名：共享页面:netbird创建第1页
黑色
白色
灰色
红色
黄色
绿色
青色
蓝色
紫色
其他颜色...
Window ME操作
live
共享页面列表
共享页面:netbird创建第1页
共享页面:netbird创建第2页
共享页面:netbird创建第3页
私有页面列表
就绪
开始
16:04

chat


无标题 - chat
文件(F) 编辑(E) 查看(V) 帮助(H)
user1对song说：你好
song对user1说：你好
netbird对所有人说：今天讨论下周的工作计划
所有人
netbird
user1
song
你对所有的人说：
发送(S)

Web sharing

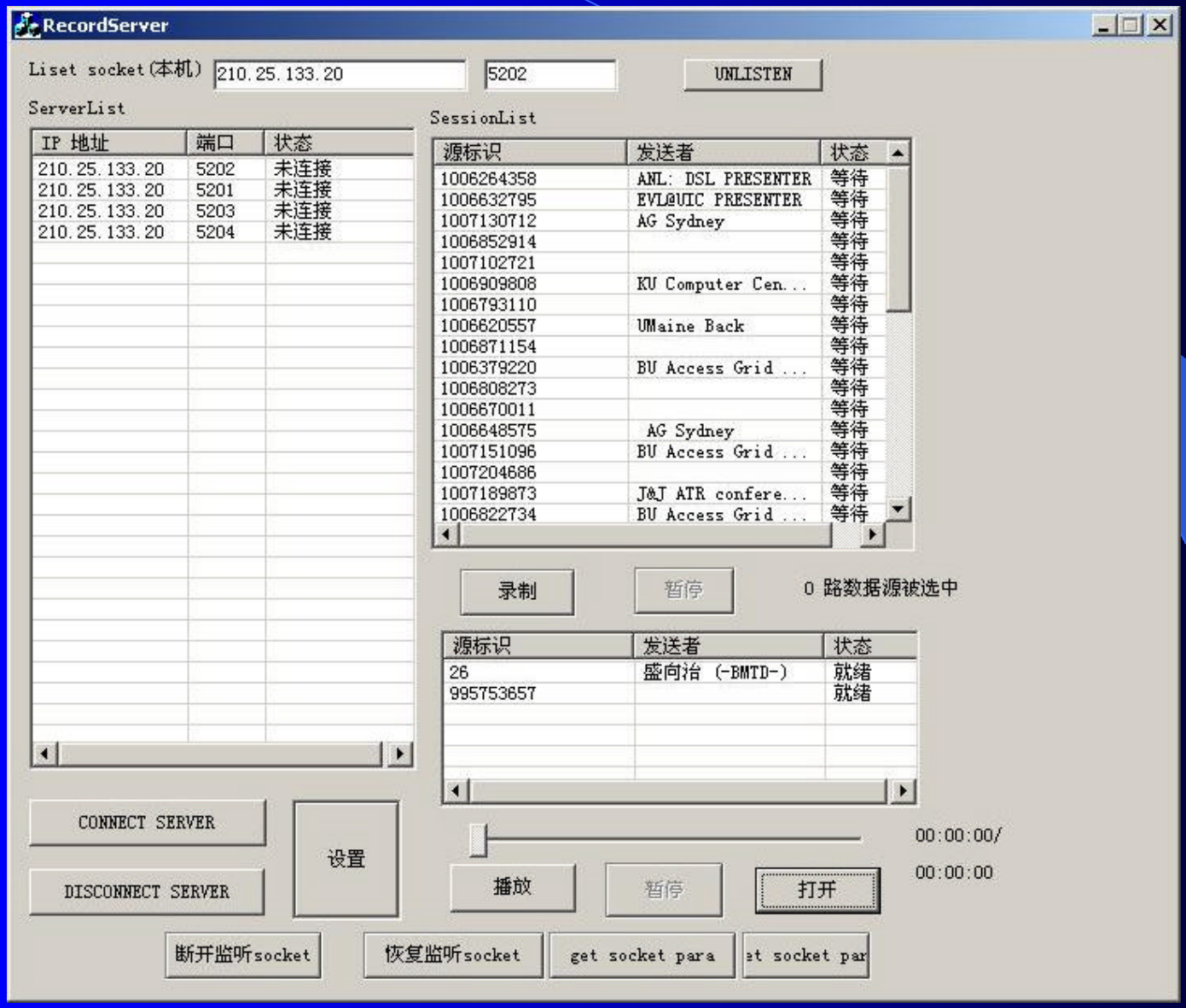

[263在线--中国人的网上家园]____电话：2631____用户名、口令：263____即可上网
文件(F) 编辑(E) 查看(V) 帮助(H)
地址(D) http://www.263.net/
转到
网址共享
网页共享
263在线
263.net
新闻 | 财经 | 游戏 | 棋牌 | 留学 | 科技 | 娱乐 | 生活 | 女性 | 健康 | 社区 | 贺卡 | 聊天 | 商城
【天下邮-免费信箱：
@263.net
密码：
登录
申请.找回密码】【收费信箱.企业信箱】
【263推荐】
雅思、电脑培训网上报名
赢海岛游分享新碧抗晒秘诀
海量处理，今日实现
安全之星反黑客内幕 new
"中国电信"改头换面
来自新加坡的就业机会
想赢取可口可乐大奖吗？
【新闻中心】 2001.6.12
菲人质危机升级 独立日上演血腥一幕
国家开发行将发行第六期金融债
网易CEO和COO辞职 丁磊代理其职
广东水患新险情：水库堤坝轰然崩个大口
穿帮又见穿帮：珍珠港的28个错误
绝对经典：每个男人必备的20件小玩意(组图)
NBA-湖人赢球不靠大腕 76人主场痛失好局
【搜索引擎】 新站登录
热点:求职 聊天 手机 OICQ 旅游
网站
搜索
张驰专题：《我家"笨笨"上剑桥》
西安主叫业务全面开通
1000000用户的上网选择
深沪股市查询
股票代码
查询
多看一眼 多点一下
【全国聊天网】..16734 人
您的昵称
聊天软件
选择房间
进入
中国共产党80周年
中国大学排行榜 2001
送个大奖给老爸
开张店庆，低至3折new
95963笑傲江湖游戏频道
了解新股一一掘第一桶金
东方逍遥卡全新登陆上海
e世代的两性交友乐园new
互联网周刊三周年庆典
263数据港送免费网上广告
北京联合海诚公司招聘
心灵互动，卡秀沟通new
【今日 263】居全程导航
帮你寻找身边的股市黑马--股票投资分析系统
世界首例攻击白宫病毒"海南岛"惊现263
夫妻恋人必看：睡姿泄露你们的秘密(组图)
263手机短信让你第一个知道体彩信息
夏令营移师海外 "修学游"京城升温
【商城热卖】 夏日扮靓宝典
8元起
名贵香水 IP卡上网卡三折
鲜花蛋糕 网羽拍 军刀特价
特价空调 松下精品小家电
快乐猪仔一家亲 粮油饮料送货上门
数码相机780元 买手机送缤纷好礼
【263导航】 网站地图
新闻中心 - 滚动、图片、专题、国内、国际、军事、体育、科技、娱乐、社会 ……
天赢财经 - 财经动态、股市行情、股评、专家在线、理财、外汇、网上交易 ……
漂亮女人 - 时装、妆容、情感、健身、两性、第六感知、精致生活、疯狂购物 ……
时尚生活 - 吃喝、运动、减肥、网上房源、宠物、汽车、招聘、跳蚤市场 ……
影音娱乐 - 快讯、影视、音乐、古典、追星、下载、点歌、视听、电台、排行 ……
游戏时代 - 围棋网、棋牌中心、游戏战网、攻略秘籍、游戏排行榜、游戏论坛 ……
教育资讯 - 留学指南、签证攻略、留学咨询、远程教育、名校展场、移民咨询 ……
科技时代 - 软件、硬件、病毒急救、时尚电子、科技资讯、IT科技、生活科技 ……
手机短信
虫语.股市.邮件.天气
手机号码
注册
在线服务
上网服务 中国婚介
跳蚤市场 网上房源
天气预报 点歌送歌
个人主页 网友论坛
留学咨询 访谈直播
新品试用 在线杀毒
网上求助 体育彩票
用户名：263
密 码：263
精彩专题
尼泊尔王室灭门惨案
山重水复"入世"路
雅思将取代托福
国产车价格放开
新浪高层地震
NBA总决赛追踪报道
上海国际电影节
同性爱--危险的关系
数字

Conference management tools

- **Session management tool**
  - **Create, listen, explain, join… conference**
- **Media archiving tool**
  - **Playback and record the realtime conference.**

Session management tool

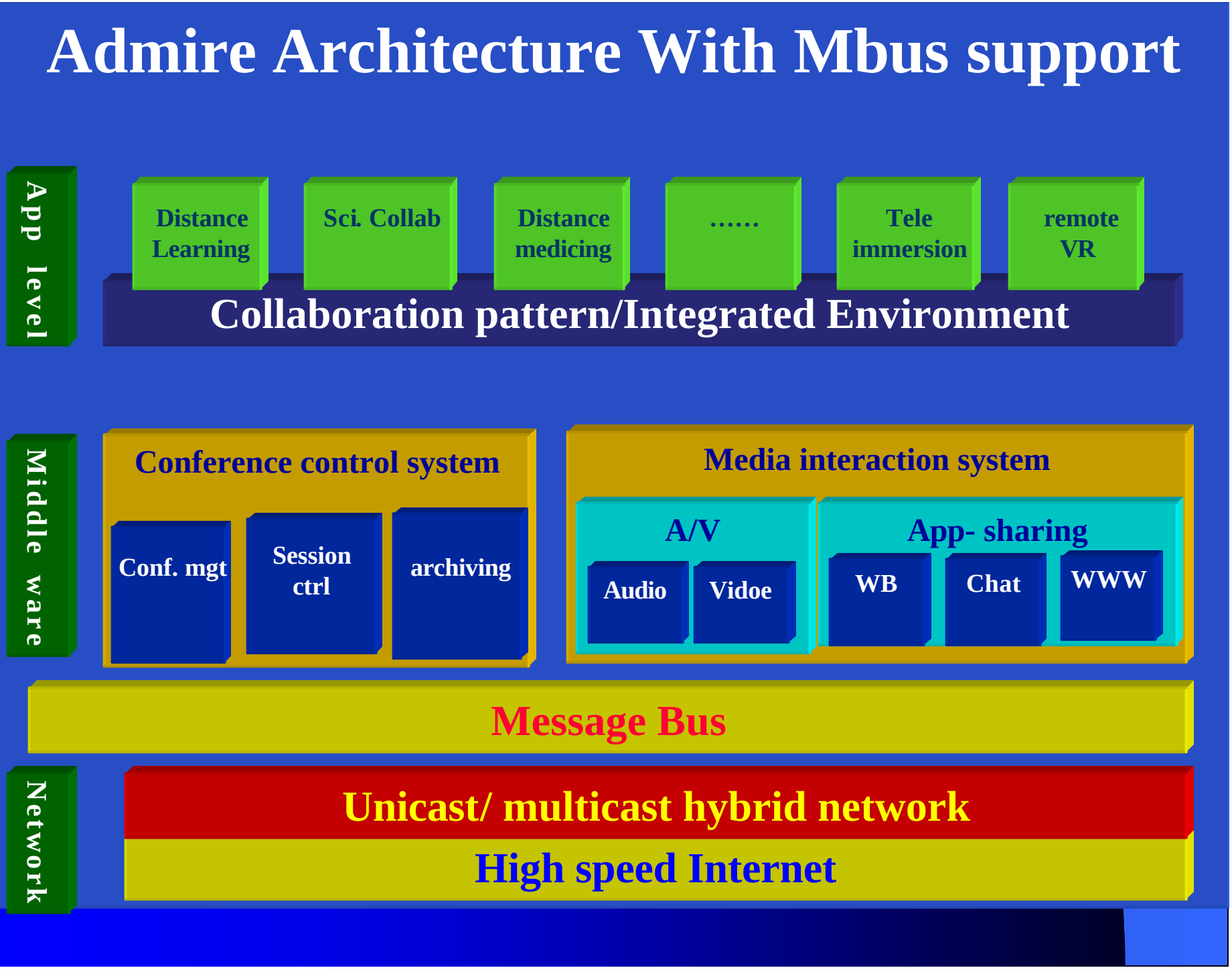
Media archiving tool

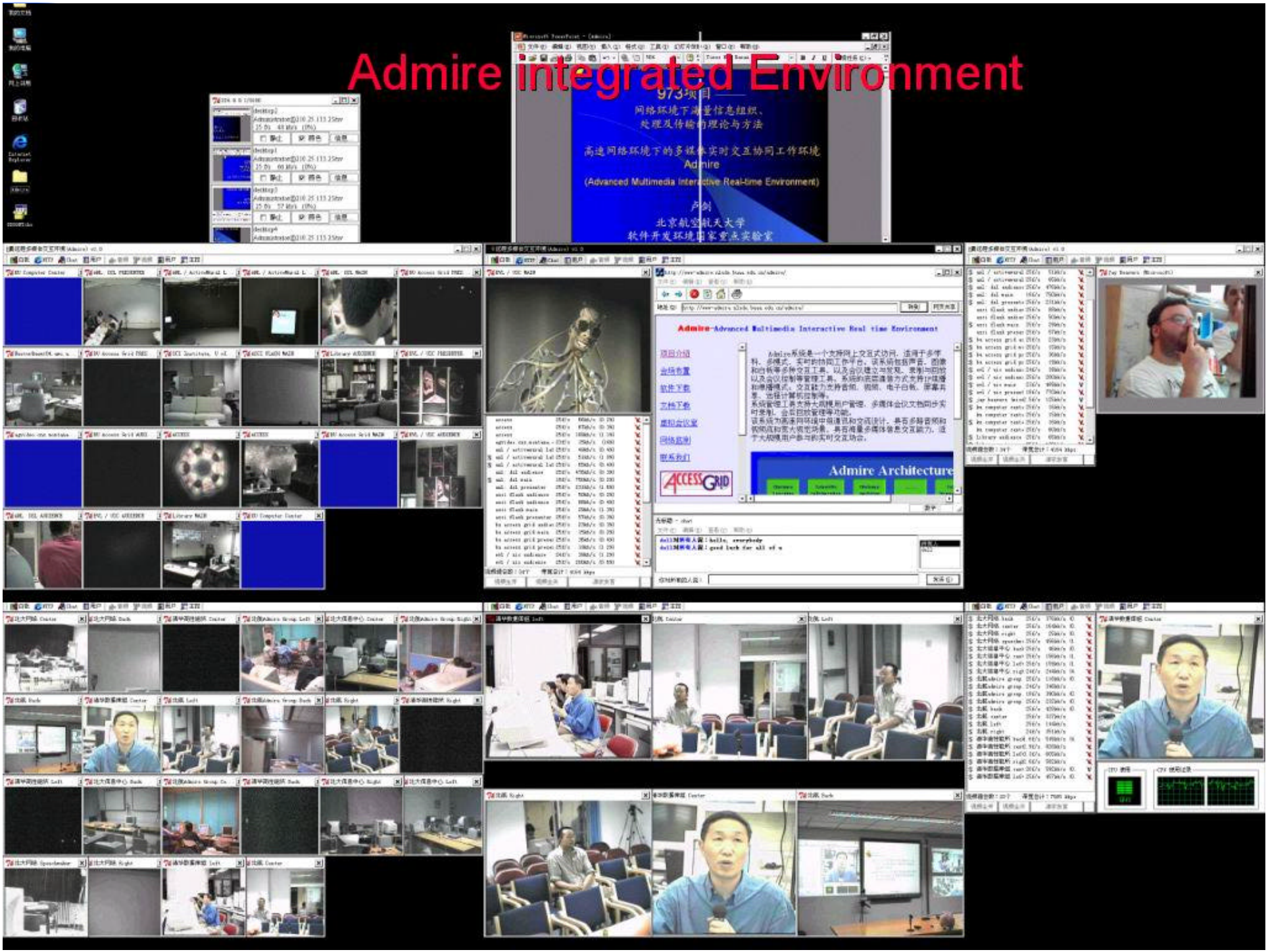


Integrated Environment

- **Designed and implemented a management subsystem**
  - **Provide the coordination of video, audio, whiteboard, desktop sharing, WWW, chat, etc to form a seamless multimedia interactive environment.**
  - **Bi-lingual support and auto select (English and Chinese)**

Admire Architecture With Mbus support

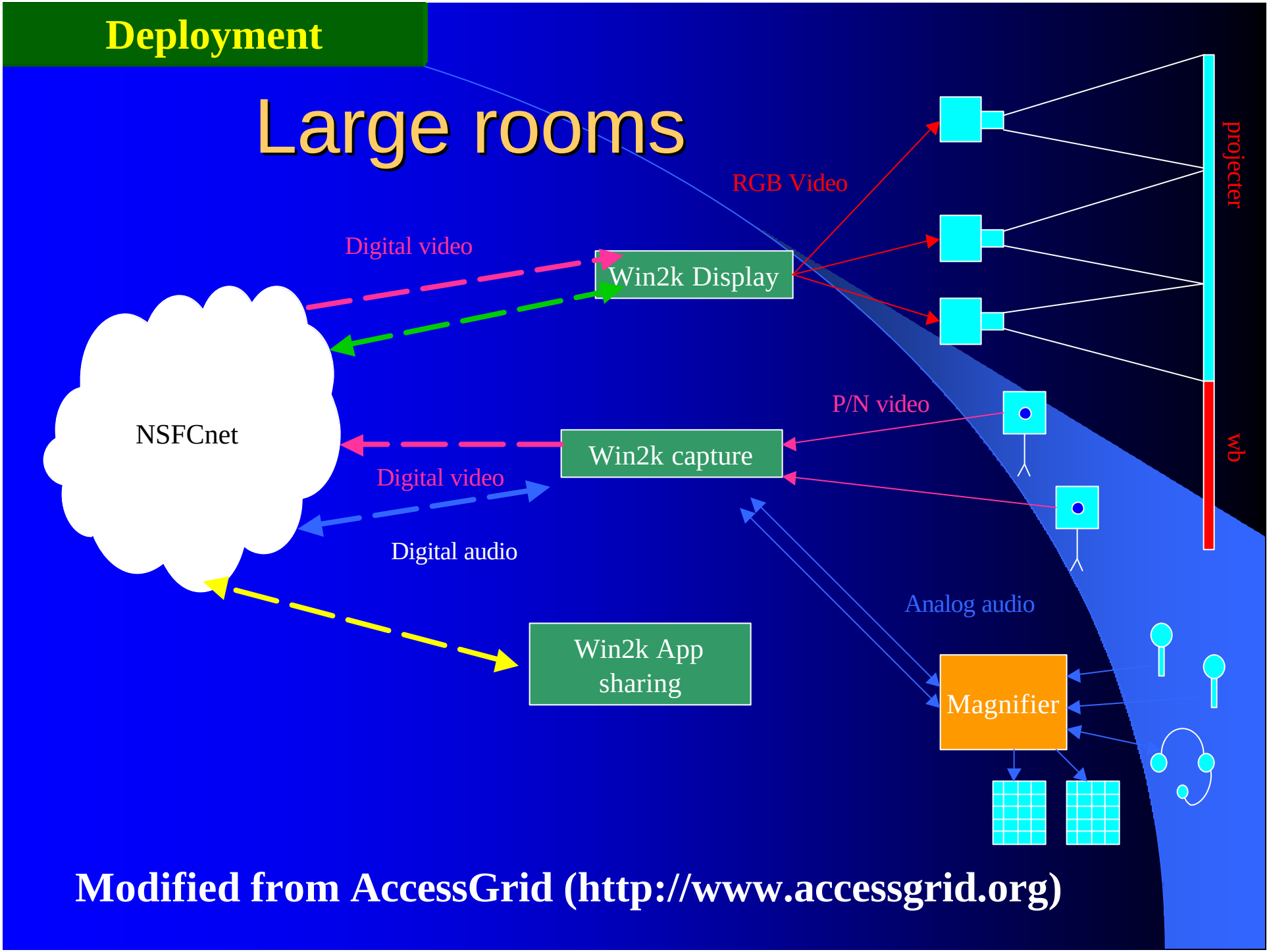



Admire integrated Environment
973项目
网络环境下海量信息组织、
处理及传输的理论与方法
高速网络环境下的多媒体实时交互协同工作环境
Admire
(Advanced Multimedia Interactive Real-time Environment)
北京航空航天大学
软件开发环境国家重点实验室
Admire-Advanced Multimedia Interactive Real-time Environment
Admire Architecture
ACCESS GRID

software packages

- **Admire in Win2k two**
  - **1 for display**
  - **1 for A/V capture**
- **Admire in one Win2k box**
  - **1 for A/V capture and display**

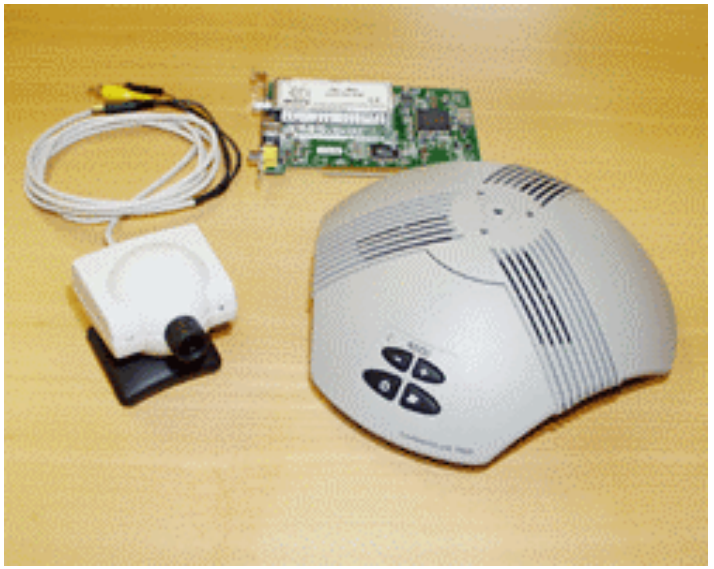
Deployment


Large rooms
RGB Video
projecter
Digital video
Win2k Display
NSFCnet
P/N video
wb
Win2k capture
Digital video
Digital audio
Analog audio
Win2k App sharing
Magnifier
Modified from AccessGrid (http://www.accessgrid.org)

Personal configuration

Group configuration

desktop



laptop

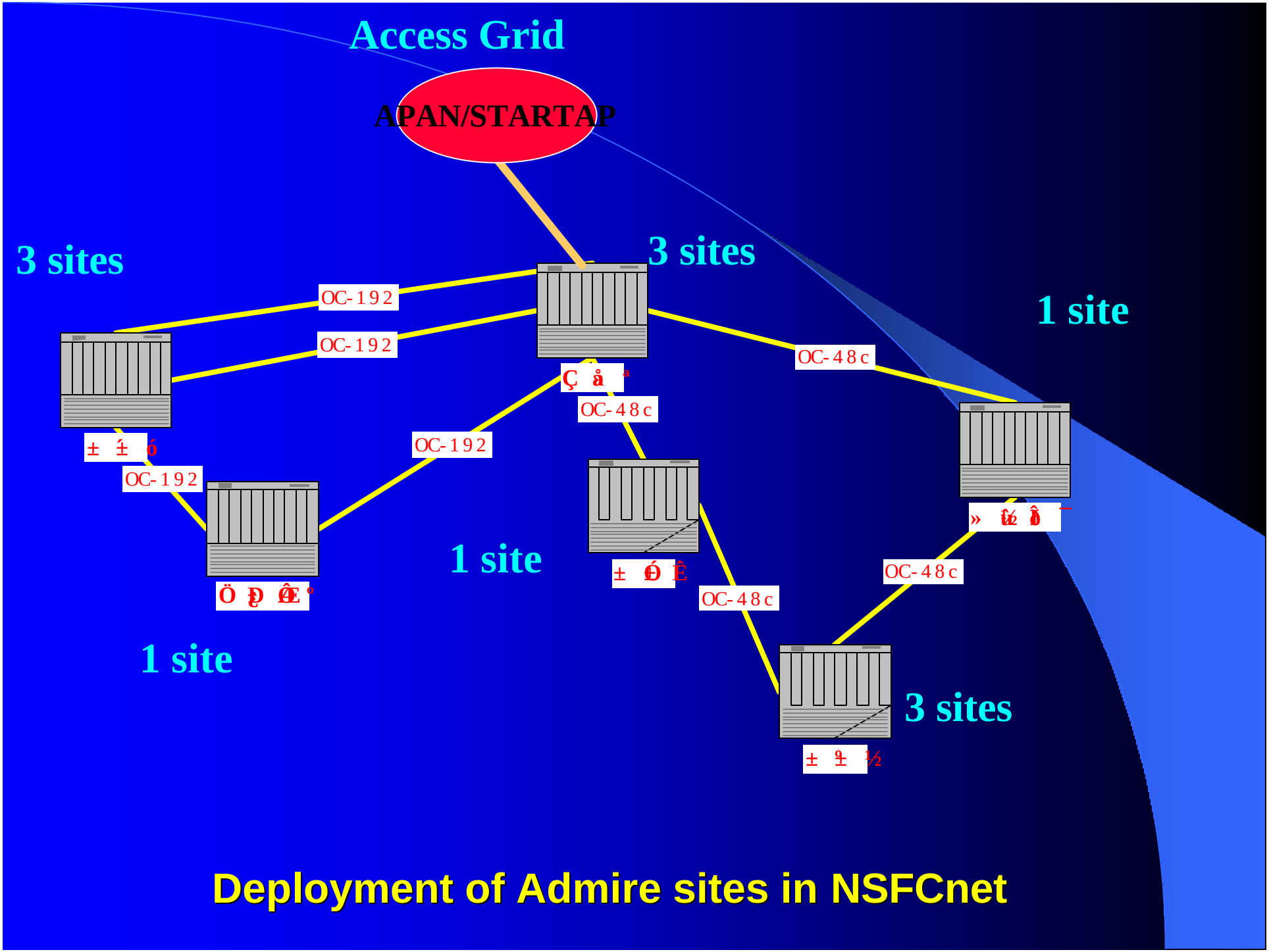
Modified from www.marratech.com

Brief summary

- IP based Large scale real time multimedia conference tools?
- Support multi-user A/V interaction (40~50 channel)
- Multimode collaboration tools(WB, App, Web, Chat, etc)
- enables users from distributed places to communicate, good for group collaboration (20~30 remote sites)

Admire Deployment

- **Admire research is supported by a national key project of MOST**
- **Ten research groups of this project are distributed on NSFCnet**
  - **Beijing University of Aero. & Astr.**
  - **Tsinghua University**
  - **Beijing University**
  - **Etc.**
  - **More than 80 scientists**
- **Admire is a persistent collaboration environment between these research groups**



Deployment of Admire sites in NSFCnet


谢谢！


谢谢！

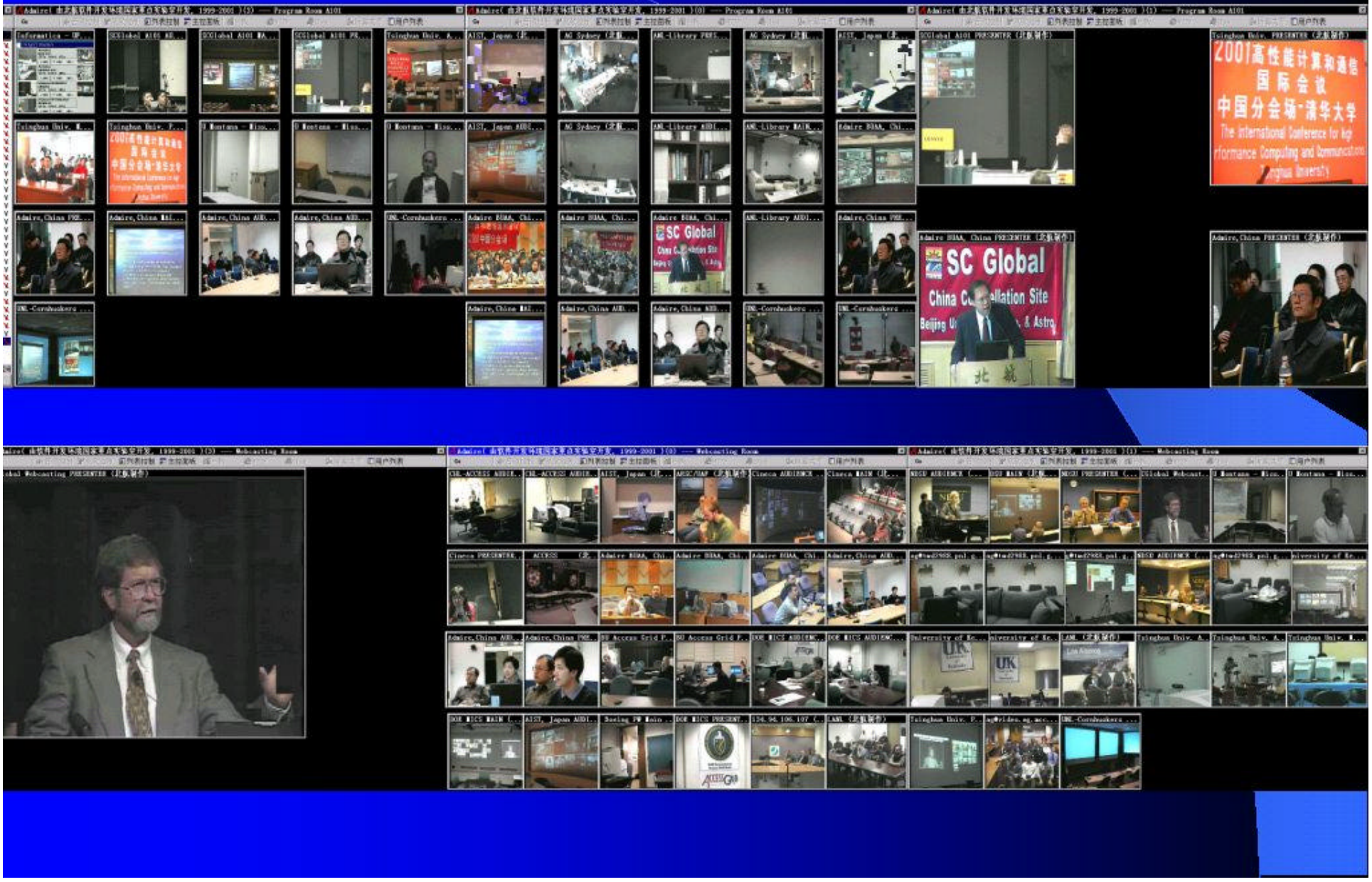
Related works

- **Based on works by UC Berkeley's Mash project , and UC of London's Mice project.**
- **Deployment in U.S. Univ.s**
  - **Access Grid**

SC Global
-connecting Admire and AG together

- ***SC Global***
  SC2001 - SC Global - November 10-16, 2001
- **The First Truly Global Technical Conference on the Grid**
- **It connects Admire group at NLSDE and Access Grid**
- **Admire group has become a SC *Constellation sites* in China.**

参与SC Global 2001活动



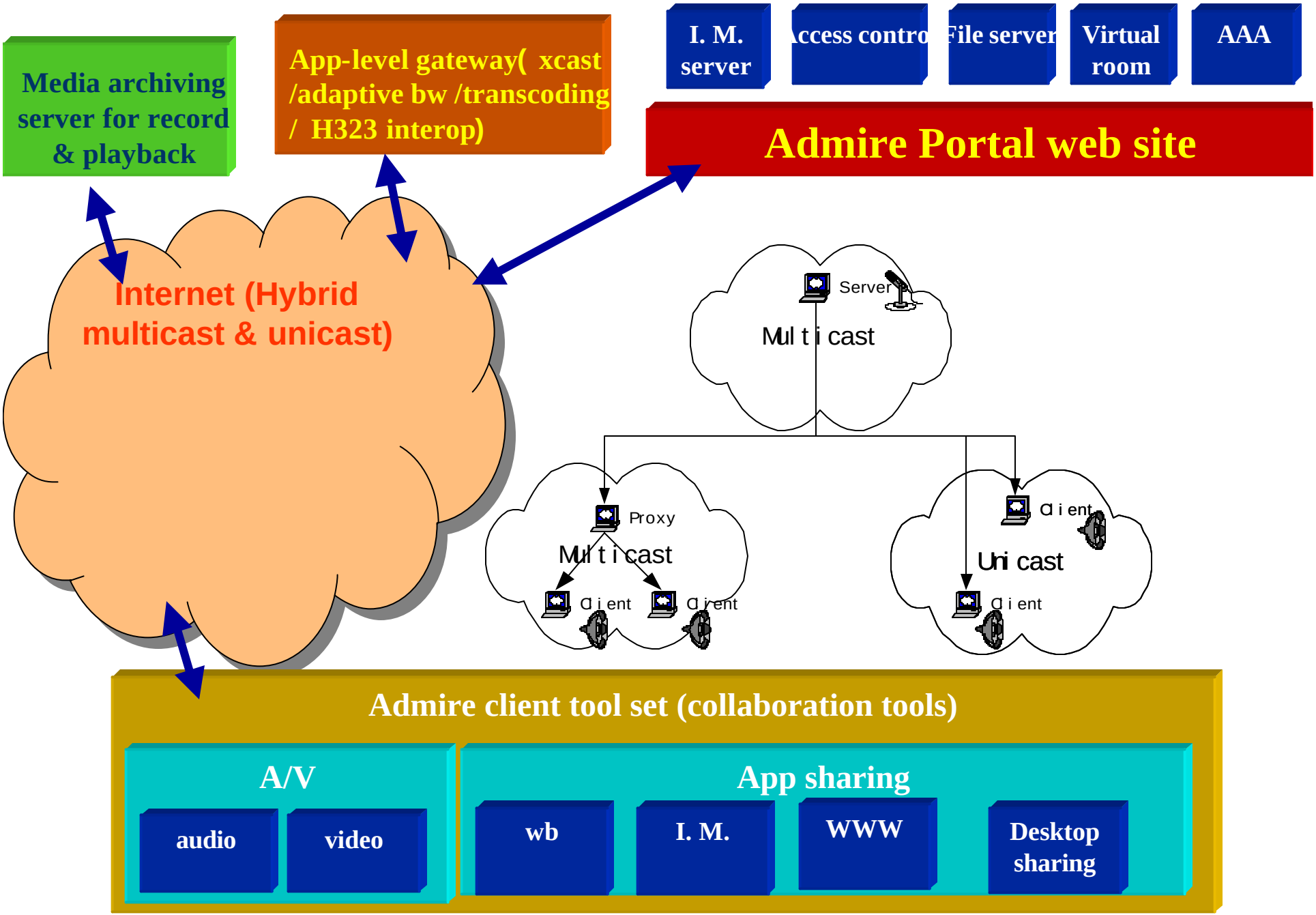
Technical challenge & solutions

Technical challenges

- **Current Admire capability**
  - **About 40~50 A/V streams and participants**
- **How to handle large scale participants situation? For example, a hundred sites, and thousand-channel streams**

Technical solutions

- **QoS and Synchronization**
  - **IP QoS + Application QoS**
  - **Synchronization between different media, Admire Client tools**
- **Admire Portal site : Organization & Management**
- **Scalable System Architecture**
  - **Software Bus for system development and management**
  - **Admire Application level gateway**
    - **Transcoding,Unicast &multicast transparency,Interoperate with H.323 client**


Media archiving server for record & playback
App-level gateway(xcast /adaptive bw /transcoding / H323 interop)
I. M. server
Access contro
File server
Virtual room
AAA
Admire Portal web site
Internet (Hybrid multicast & unicast)
Server
Multicast
Proxy
Multicast
Client
Client
Client
Unicast
Client
Admire client tool set (collaboration tools)
A/V
audio
video
App sharing
wb
I. M.
WWW
Desktop sharing

Deployment of Admire and Access Grid across the country

National video conference system

for Scientific Research

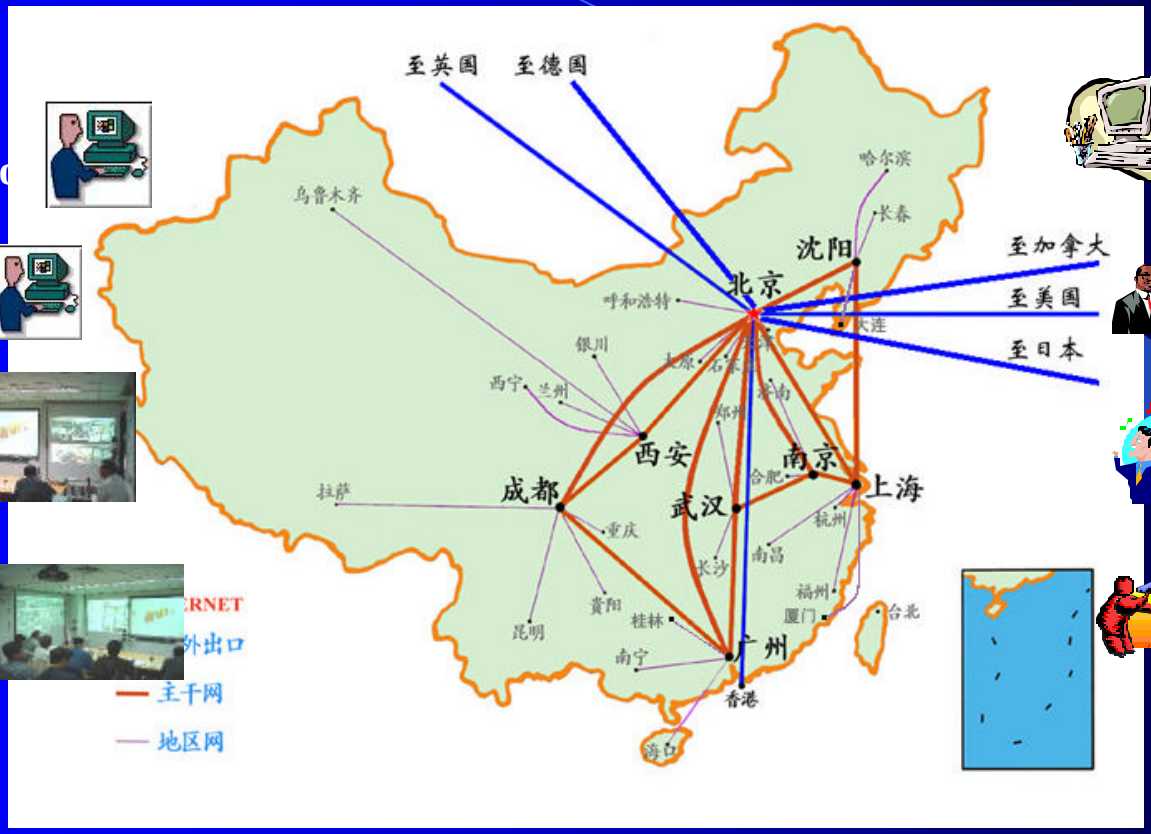
National video conference system for Scientific Research

Administrator,Government

Researcher, Students, …

Remote presentation

Remote seminar



Retrieving Data

conferencing

Site visiting

News Announcement

National conference center/regional access points

Open standard for connecting to “National A/V system for Research”

High speed network environment CERNET

National Access Center for A/V system of Scientific Research

South China Access Server

Mid China Access Server

North China Access Server

North-East China Access Server

South-West China Access Server

1Gbps Switch

South-East China Access Server

CERNET Core Router

National A/v Access Server

North-West China Access Server

Future work

- **More scalable**
  - **Dynamic resource scheduling**
  - **TCP Friendly Congestion Control of A/V streams**
  - **More scalable close-coupled conference control**
  - **Layered multimedia data transportation**
  - **Source specific multicast……**
- **More user-friendly**
  - **Persistent Meeting Space**
  - **Group Awareness**
  - **Seamless integrations with distributed resources**
  - **……**
- **More widely deployed**
- **IPv6 enabled**


Thank you!
http://www.nlsde.buaa.edu.cn/admire/